

PATENT SPECIFICATION

NO DRAWINGS

1,081,106

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Date of Application and filing Complete Specification: Nov. 5, 1964.
No. 45178/64.

Application made in United States of America (No. 331390) on Dec. 18, 1963.
Complete Specification Published: Aug. 31, 1967.
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PATENTS ACT, 1949

SPECIFICATION NO. 1,081,106

The following corrections were allowed under Section 76 on 26th October 1967:

Page 2, line 29, for "cholorophyllin" read "chlorophyllin"

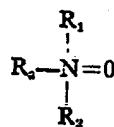
Page 3, lines 11, 26, 87, 103, 112 and 115, for "lauroyl" read "lauryl"

Page 3, lines 44 and 68, after "mixture" insert "of"

THE PATENT OFFICE,
21st December 1967

D 994

15 water-insoluble polishing agent, an anionic detergent and a compound having the general formula:



20 wherein R_1 and R_2 are methyl groups and R_3 is an alkyl radical having a carbon chain containing from 10 to 18 carbon atoms, the amount of the said compound being in the range 0.1 to 5% by weight of the preparation and sufficient to inhibit odour in saliva.

25 Specific amine oxides which provide improved products when incorporated into dental preparations include dodecyl dimethylamine oxide, cetyl dimethylamine oxide, myristyl dimethylamine oxide and mixtures thereof, such as a mixture of myristyl and dodecyl dimethylamine oxides. A preferred mixture of oxides is a mixture of alkyl dimethylamine oxides wherein the distribution of chain lengths of the alkyl groups is approximately as follows: C_{10} —3.2%, C_{12} —54.9%, C_{14} —32.2%, C_{16} —9.2% and C_{18} —0.4%.

30 The oxides of the above general formula possess properties which are particularly advantageous in dental preparations. Espe-

dentifrices, lozenges or lauvis. These preparations may contain various adjuvant materials in suitable amounts provided these do not substantially adversely affect the desired results.

35 Any suitable water-insoluble polishing agent may be admixed with the oxides in the preparation of dentifrice compositions such as tooth powders, pastes and creams. Representative polishing materials include dicalcium phosphate, tricalcium phosphate, insoluble sodium metaphosphate, aluminium hydroxide, magnesium carbonate, calcium sulphate, bentonite and mixtures thereof. It is preferred to use the water-insoluble calcium or magnesium salts as the polishing agents and, more particularly, calcium carbonate and/or a calcium phosphate, such as dicalcium phosphate dihydrate. In general, these polishing agents will comprise a major proportion by weight of the solid ingredients. The polishing agent content is variable, but will generally be up to 95% by weight of the total composition. In the case of a dental cream, such polishing agents will generally comprise from 20% to 75%, preferably 45% to 55%, whereas in tooth powders the polishing agents will usually be in greater proportion, such as from 70% to 95%.

[F 7.]

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Index at acceptance: —A5 B32

Int. Cl.: —A 61 h 7/16

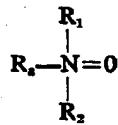
COMPLETE SPECIFICATION

Dental Preparations Containing Amine Oxides

We, COLGATE-PALMOLIVE COMPANY, a Corporation organised and existing under the Laws of the State of Delaware, United States of America, of 300 Park Avenue, New York, New York 1022, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and 10 by the following statement:—

The present invention relates to dental preparations.

A dental preparation according to the invention comprises a compatible mixture of a water-insoluble polishing agent, an anionic detergent and a compound having the general formula:



wherein R_1 and R_2 are methyl groups and 20 R_2 is an alkyl radical having a carbon chain containing from 10 to 18 carbon atoms, the amount of the said compound being in the range 0.1 to 5% by weight of the preparation and sufficient to inhibit odour in saliva.

Specific amine oxides which provide improved products when incorporated into dental preparations include dodecyl dimethylamine oxide, cetyl dimethylamine oxide, myristyl dimethylamine oxide and mixtures thereof, such as a mixture of myristyl and dodecyl dimethylamine oxides. A preferred mixture of oxides is a mixture of alkyl dimethylamine oxides wherein the distribution of chain lengths of the alkyl groups is approximately as follows: C_{10} —3.2%, C_{12} —54.9%, C_{14} —32.2%, C_{16} —9.2% and C_{18} —0.4%.

The oxides of the above general formula possess properties which are particularly advantageous in dental preparations. Espe-

cially notable is their ability to inhibit odour in saliva, even in the presence of anionic detergents which are commonly used in dental preparations and which have been found in some cases to impair the efficiency of other odour inhibiting additives.

The oxides may be utilized in any preparations comprising a compatible mixture of a water-insoluble polishing agent and an anionic detergent and designed for application to the oral cavity, which preparations are referred to herein as dental preparations. Such dental preparations include toothpastes and dental creams, tooth powders, liquid dentifrices, lozenges or tablets. These preparations may contain various adjuvant materials in suitable amounts provided these do not substantially adversely affect the desired results.

Any suitable water-insoluble polishing agent may be admixed with the oxides in the preparation of dentifrice compositions such as tooth powders, pastes and creams. Representative polishing materials include dicalcium phosphate, tricalcium phosphate, insoluble sodium metaphosphate, aluminium hydroxide, magnesium carbonate, calcium sulphate, bentonite and mixtures thereof. It is preferred to use the water-insoluble calcium or magnesium salts as the polishing agents and, more particularly, calcium carbonate and/or a calcium phosphate, such as dicalcium phosphate dihydrate. In general, these polishing agents will comprise a major proportion by weight of the solid ingredients. The polishing agent content is variable, but will generally be up to 95% by weight of the total composition. In the case of a dental cream, such polishing agents will generally comprise from 20% to 75%, preferably 45% to 55%, whereas in tooth powders the polishing agents will usually be in greater proportion, such as from 70% to 95%.

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In dental cream formulations, the liquids and solids are proportioned to form a creamy mass of desired consistency which is extrudable from a collapsible aluminium or lead tube. In general, the liquids in the dental cream will comprise chiefly water and/or a humectant or binder such as glycerine, sorbitol or propylene glycol, including mixtures thereof. The total liquid content will generally be from 20% to 75% preferably 40% to 50%, by weight of the formulation. It is preferred also to use in dental creams a gelling agent such as the natural and synthetic gums and gum-like materials, e.g. Irish moss, gum tragacanth, sodium carboxymethylcellulose, polyvinylpyrrolidone or starch, usually in an amount up to 10% and preferably from 0.5% to 5% of the formulation. Various other adjuvant materials which do not substantially adversely affect the desired properties and characteristics may also be incorporated in the dental preparations. Typical of the adjuvants that may be used are soluble saccharin, flavouring oils (e.g. oils of spearmint, peppermint or wintergreen) colouring or whitening agents (e.g. titanium dioxide) preservatives (e.g. sodium benzoate) emulsifying agents, alcohol and menthol. Other suitable adjuvants are chlorophyllin and various ammoniated ingredients, such as urea, diammonium phosphate and mixtures thereof. The following examples illustrate the invention. The compositions described are prepared in the usual manner as indicated, and all amounts of the various ingredients are by weight unless otherwise specified.

EXAMPLE 1		
Dental Cream		
40	Glycerine	Per cent 23.95
	Sodium carboxymethyl-cellulose (CMC)	0.75
45	Saccharin	0.20
	Sodium benzoate	0.50
	Water	15.59
	Tetrasodium pyrophosphate	0.25
	Dicalcium phosphate	46.75
50	Calcium carbonate	5.00
	Sodium lauroyl sarcosinate (35% solution)	5.71
	Flavour	0.80
	Dodecyl dimethylamine oxide	0.50
	Total	100.00

EXAMPLE 2	55
Dental Cream	
A dental cream of the composition of Example 1 was prepared, but dodecyl dimethylamine oxide was replaced by cetyl dimethylamine oxide.	

EXAMPLE 3	60
Dental Cream	
A dental cream of the composition of Example 1 was prepared, but dodecyl dimethylamine oxide was replaced by a mixture of dodecyl and myristyl dimethylamine oxides. The distribution of the chain lengths of the alkyl groups in the mixture was approximately as follows: C_{11} —3.2%, C_{12} —34.9%, C_{14} —32.2%, C_{16} —9.2% and C_{18} —0.4%.	

EXAMPLE 4	65																						
Dental Cream																							
<table border="1"> <thead> <tr> <th></th> <th>Per cent</th> </tr> </thead> <tbody> <tr> <td>Glycerine</td> <td>26.00</td> </tr> <tr> <td>Irish moss gum</td> <td>1.40</td> </tr> <tr> <td>Benzoic acid</td> <td>1.00</td> </tr> <tr> <td>Saccharin</td> <td>0.20</td> </tr> <tr> <td>Water</td> <td>17.90</td> </tr> <tr> <td>Hydrated alumina</td> <td>50.00</td> </tr> <tr> <td>Sodium laureyl sarcosinate</td> <td>2.00</td> </tr> <tr> <td>Flavour</td> <td>1.00</td> </tr> <tr> <td>Decyl dimethylamine oxide</td> <td>0.50</td> </tr> <tr> <td>Total</td> <td>100.00</td> </tr> </tbody> </table>			Per cent	Glycerine	26.00	Irish moss gum	1.40	Benzoic acid	1.00	Saccharin	0.20	Water	17.90	Hydrated alumina	50.00	Sodium laureyl sarcosinate	2.00	Flavour	1.00	Decyl dimethylamine oxide	0.50	Total	100.00
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EXAMPLE 5	80																								
Dental Cream																									
<table border="1"> <thead> <tr> <th></th> <th>Per cent</th> </tr> </thead> <tbody> <tr> <td>Glycerine</td> <td>23.95</td> </tr> <tr> <td>CMC</td> <td>0.75</td> </tr> <tr> <td>Saccharin</td> <td>0.20</td> </tr> <tr> <td>Sodium benzoate</td> <td>0.50</td> </tr> <tr> <td>Water</td> <td>17.55</td> </tr> <tr> <td>Dicalcium phosphate</td> <td>47.00</td> </tr> <tr> <td>Calcium carbonate</td> <td>5.00</td> </tr> <tr> <td>Sodium salt of hydrogenated coconut oil fatty acid monoglyceride monosulphonate</td> <td>3.75</td> </tr> <tr> <td>Flavour</td> <td>0.80</td> </tr> <tr> <td>Dodecyl dimethylamine oxide</td> <td>0.50</td> </tr> <tr> <td>Total</td> <td>100.00</td> </tr> </tbody> </table>			Per cent	Glycerine	23.95	CMC	0.75	Saccharin	0.20	Sodium benzoate	0.50	Water	17.55	Dicalcium phosphate	47.00	Calcium carbonate	5.00	Sodium salt of hydrogenated coconut oil fatty acid monoglyceride monosulphonate	3.75	Flavour	0.80	Dodecyl dimethylamine oxide	0.50	Total	100.00
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Dodecyl dimethylamine oxide	0.50																								
Total	100.00																								

EXAMPLE 6				EXAMPLE 9			
Dental Cream				Dental Cream			
		Per cent			Per cent		
5	Glycerine	23.95	Glycerine	27.10			
	CMC	0.75	Irish moss gum	1.40	60		
	Saccharin	0.20	Sodium benzoate	0.15			
	Sodium benzoate	0.50	Saccharin	0.20			
	Water	18.80	Water	22.15			
10	Dicalcium phosphate	48.00	Insoluble sodium metaphosphate	40.60			
	Calcium carbonate	5.00	Anhydrous dicalcium phosphate	5.00	65		
	Sodium lauroyl sulphate	1.50	Titanium dioxide	0.40			
	Flavour	0.80	Sodium lauroyl sulphoacetate	1.50			
	Stearyl dimethylamine oxide	0.50	A mixture alkyl dimethylamine oxides in which the alkyl groups consist of saturated straight chain hydrocarbon radicals containing from 10 to 18 carbon atoms in approximately the following distributions: C ₁₀ —3.2%, C ₁₂ —54.9%, C ₁₄ —32.2%, C ₁₆ —9.2% and C ₁₈ —0.4%		70		
	Total	100.00					
15	EXAMPLE 7						
	Dental Cream						
		Per cent					
20	Glycerine	27.10					
	Irish moss gum	1.40					
	Sodium benzoate	0.15					
	Saccharin	0.20					
	Water	22.15					
	Insoluble sodium metaphosphate	40.60					
25	Anhydrous dicalcium phosphate	5.00					
	Titanium dioxide	0.40					
	Sodium lauroyl sulphate	1.50					
	Myristyl dimethylamine oxide	0.50					
	Flavour	1.00					
	Total	100.00					
30	EXAMPLE 8						
	Dental Cream						
		Per cent					
35	Glycerine	27.10					
	Irish moss gum	1.40					
	Sodium benzoate	0.15					
	Saccharin	0.20					
	Water	22.15					
	Insoluble sodium metaphosphate	40.60					
40	Anhydrous dicalcium phosphate	5.00					
	Titanium dioxide	0.40					
	The sodium salt of coconut oil fatty acid monoglyceride monosulphonate	1.50					
45	A mixture alkyl dimethyl amine oxides in which the alkyl groups consist of saturated straight chain hydrocarbon radicals containing from 10 to 18 carbon atoms in approximately the following distributions: C ₁₀ —3.2%, C ₁₂ —54.9%, C ₁₄ —32.2%, C ₁₆ —9.2% and C ₁₈ —0.4%	0.50					
	Flavour	1.00					
50	Total	100.00					
55							

EXAMPLE 10
Tooth Powder

	Per cent
Sodium n-lauroyl sarcosinate	4
Disodium acid pyrophosphate	2
Cetyl dimethylamine oxide	5
Saccharin	0.1
Flavour	2.5
Dicalcium phosphate dihydrate	Balance

The beneficial effects of the alkyl dimethylamine oxide additives are realized at relatively low concentrations. Excellent results are generally obtained where the compound is present in an amount ranging up to 5.0% by weight of the dental preparation. In the case of lozenges and tablets a concentration of 0.1% or lower may be employed.

The anionic detergent ingredients preferred for use in the present compositions include sodium lauroyl sarcosinate, Na H-coco monoglyceride sulphate, i.e. the sodium salt of hydrogenated coconut oil fatty acid monoglyceride monosulphate, sodium lauroyl sulphate and sodium coco-monoglyceride sulphonate, i.e. the sodium salt of coconut oil fatty acid monoglyceride monosulphonate.

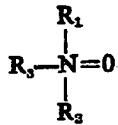
Other anionic detergents which are conventionally incorporated in dental preparations and in the presence of which the alkyl dimethylamine oxides function efficiently include a combination of sodium lauroyl sarcosinate and sodium lauroyl sulphate, a combination of Na H-coco-monoglyceride sulphate and sodium lauroyl sarcosinate, and sodium lauroyl sulphoacetate.

The anionic detergent compounds ordinarily

are incorporated into dental preparations in amounts up to 5.0% by weight.

WHAT WE CLAIM IS:—

5 1. A dental preparation comprising a compatible mixture of a water-insoluble polishing agent, an anionic detergent and a compound having the general formula:



10 10. wherein R_1 and R_2 are methyl groups and R_3 is an alkyl radical having a carbon chain containing from 10 to 18 carbon atoms, the amount of the said compound being in the range 0.1 to 5% by weight of the preparation and sufficient to inhibit odour in saliva.

15 15. 2. A dental preparation as claimed in Claim 1 in which the said compound is dodecyl dimethylamine oxide, cetyl dimethylamine oxide or myristyl dimethylamine oxide.

3. A dental preparation as claimed in Claim 1 in which the said compound is a mixture of myristyl dimethylamine oxide and dodecyl dimethylamine oxide.

4. A dental preparation as claimed in any of the preceding claims containing from 20% to 75% by weight of a mixture of water and a humectant, from 20% to 75% by weight of the polishing agent, and up to 5.0% by weight of the anionic detergent.

5. A dental preparation as claimed in Claim 4 wherein the humectant is glycerine.

6. A dental preparation as claimed in any of Claims 1 to 3 containing from 40% to 50% by weight of a mixture of water and glycerine, from 45% to 55% by weight of the polishing agent, and up to 5.0% by weight of the anionic detergent.

7. A dental preparation substantially as described in any of the Examples.

KILBURN & STRODE,
Chartered Patent Agents,
Agents for the Applicants.